LITTLE BLUE BOOK NO. 1389
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HALDEMAN-JULIUS PUBLICATIONS
GIRARD, KANSAS

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PRINTED IN THE UNITED STATES OF AMERICA

THE TRUTH ABOUT THE TOBACCO HABIT

A young friend of mine of the trouser-wearing male sex recently developed a pain in his stomach. He decided to wait it out. But it was an indecent as well as an insidious sort of pain and finally persisted so long that he was driven to consult a physician for moral support. The physician said, "Do you smoke?" My friend said "Yes." The physician said, "That's it, of course. Quit smoking. Three dollars, please." My friend went away, quit smoking, and the pain persisted. He returned to the doctor. He was now given a little silver nitrate. He went away, but he came back again. By that time the physician was really angry. He said, "You've smoked yourself into a nice stomach ulcer, you have. I'll have to operate. I hate to but I have to." Just then buckwheat cakes and sausage made my friend violently ill one day and he deleted them from his diet. The pain left and has not yet played a return engagement. He smokes more than ever now, but he throws away longer butts.

Another friend of mine classifying in the male sex which so far tends to avoid wearing trousers—much—went to a physician. She complained of a rash which she said afflicted her all winter. Fortunately for the physician she smoked energetically. He therefore told her to quit and called the next patient. Since she knew that she smoked in summer as well as in winter she did not quit but, by chance, consulted a scientific nutrition investigator. There was no reason for this; she did it irrationally and by pure inadvertance. But he asked, "Do you eat anything in winter that you

do not eat in summer?" And she at first said, "No," because that is the most natural answer to make under the circumstances. Then later, after a half an hour's cross-examination, she said, "Yes, oatmeal." He said "Try cutting that out for a while." So she conquered this craving, but continued to smoke, and the rash departed for parts unknown. She had an idiosyncrasy for oatmeal proteins just as some people have for strawberry or egg proteins, and her rash was thus caused.

In a moment of more violent perversity I went not long ago to a lecture advocating ruthless war on tobacco. In spite of the success women have just had in smoking anti-cigarette reformers into comas, the speaker, Daniel H. Kress, M. D., was President of the Anti-Cigarette Alliance. Since he was a regular doctor in active practice I had a right to expect the presentation of a scientific case against tobacco.

This gentleman, who is personally one of the most delightful old souls in the world, actually completed his lecture without ever once citing a scientific authority, without once grounding upon irrefutable scientific fact and without departing widely from the most trivial and childish sort of argument from analogy. Thus he stated that a famous war hero did not smoke. Wilson did not smoke. Hughes does not smoke. The inmates of reform schools all smoke. Smokers are physically and mentally unsafe!

This may all be true for all I can prove to the contrary, but what of it? Many war heroes smoke. Grant certainly did. Small, defective and generally backward children normally spring from parents who underfeed them, who are themselves defective in heredity and who neglect to instruct their children in any essen-

tial matters. Can you prove that smoking alone either stunted them or put them in the reform school? You cannot. Criminals are predominantly religious according to their professions of faith. Did Christianity make them criminals? If smokers are mentally unsafe may I fervently declaim—God help research!

You hear it said that the children of smoking mothers are inferior. Are they? How can it be proven? As a matter of fact no scientific experiment could possibly be carried on to prove this, for statistics, being riddled by all sorts of idiosyncrasies and unknowns, are grossly unscientific. To prove it you might have the same mother have two children at separate times by the same father, smoking while she bore one and abstaining for the control child. But that would prove nothing. Each child is a unique individual arising from a unique chromosome mixture. The mother and father would of necessity be older in the one case than in the other. Nourishment and other environmental conditions would inevitably vary. The experiment is impossible. Yet until such an experiment becomes possible we are merely voicing opinions when we say that smoking causes inferior children. The actual cause may be any of a thousand other and extraneous factors.

When you consider how very often tobacco smoking is mentioned therapeutically and how universally it seems to be assumed that it is deleterious to health it is rather disconcerting to discover so little reliable scientific work to confirm this prevalent viewpoint. In fact practically no comprehensive, systematic work has been done by scientific research to prove that smoking is exceedingly harmful to the human

system. Like so many other human preconceptions this assumption rests largely upon faith. To the acutely prejudiced non-smokers smoking seems so utterly perverse that it surely must be physically injurious.

A rational esthetic case could be made out against certain women smoking. True, the modern woman so sedulously apes the other sex that to deprive her of her cigarette is simply to deprive her gracelessly of her masculinity. We should never do that. But the spectacle of a really pretty, effeminate woman smoking is nevertheless an esthetic affront. Nothing the average man can do could make him look very much worse than he does naturally so even this slight objection does not apply bisexually.

But we have wandered, and I am of course at fault, having set out laudably to lead our thought procession. In my search of the scientific literature the nearest thing to an authority I came across was perhaps Sir Humphrey Rolleston, Baronet, K. C. B.; F. R. C. P. and M. D. of Cambridge, England, physician to King George V in his late 1928 illness. He discusses "The Medical Aspects of Tobacco" in such staid British medical journals as *The Lancet* and *The Practitioner*. He reviews every possible lesion that might spring from tobacco smoking, and they are many—quite as many indeed as may spring from over eating artichokes or drinking three gallons of well-water daily. He sets himself flatly against animal experimentation in this matter because this cannot possibly take idiosyncrasies into account, and reminds us that humans are both highly individualized and exceedingly complex.

Rolleston then remarks that cigarettes are less invidious than pipes or cigars because

cigarette smoke is more air diluted. He finds a wide diversity of opinion as to the harmfulness of tobacco; he doubts that it ever affects the nervous system greatly and believes that coffee and tea usually produce the heart symptoms attributed to smoking and that a latent venereal disease accounts for much smoker's cancer. He doubts also that dilation of the œsophagus, dilation of the stomach, acid stomach and nervous dyspepsia are often due to tobacco while he commends the mildly laxative properties of a pipe after breakfast.

Finally our baronet says, and the medical journal sustains him editorially, that in view of the universality of the habit of tobacco smoking the rarity of the organic lesions that can be traced out as undoubtedly due to that habit, beyond all question, is little less than surprising. This, I should say, is the woodpile Ethiopian. It is one thing for a physician to lean back and say cut down on tobacco, coffee, fried stuff and pastry. It is quite another for him to prove scientifically that these indulgences have undeniably caused the patient's present low physical estate.

D. T. Barry, F. R. C. S. and M. D. of the Physiological Department, University College, Cork, is not very far off when he writes: "The physiological effects of tobacco, as our present knowledge reveals them, are not sufficiently deleterious to counter-balance the benign influence of the drug in other respects. It may be abused, of course, but so may food, and this latter form of abuse is, in my opinion, responsible for greater evils than those resulting from the abuse of tobacco."

In this connection another authority, Armstrong-Jones, remarks that tobacco smoking in moderation is not injurious to adults but is a

valuable sedative. It contributes to calm thought and efficient mental functioning. Worst of all he casually remarks that cigarette smoking, preferably without a holder, is the least injurious form of tobacco indulgence. Even allowing for the fact that the gentleman has seen some of the less comely holders I have witnessed in my time, his statements give pause.

Of course Earp's well-known studies at Antioch College, Ohio, did indicate that non-smokers showed an intellectual superiority over smokers, but whether these things were cause and effect or mere harmless concomitants who knows? Many very eminent intellectual giants smoked excessively. Perhaps they would have achieved absolute omnipotence or omniscience had they been non-smokers. Again, who knows?

It is significant that Earp's non-smokers showed no physical superiority over his smokers; that is, it is interesting when you remember that the American university is an institution of athletic training wherein some intellectual education is offered to the feeble-bodied as a consolation prize. Intelligence tests are not affected by smoking, the non-smokers ranking just as high after smoking as before they had ever touched the vile weed. Finally, the correlation between the length of a student's indulgence in tobacco and his scholarship is so negligible as to indicate that there can be no chronic cumulative poisoning from tobacco.

Laymen do not realize how difficult it is to trace a diseased condition to a specific cause even when bacteria abound, as is not the case in smoking. For instance certain bacteria so closely resemble each other that even experts are hard put to tell them apart. Diphtheria

germs possess such a dead ringer. Real diphtheria cultures were once sent out to clinical laboratories along with other cultures containing no diphtheria germs, but germs so closely resembling them that the laboratories involved returned all sorts of results. Some reported that the actual diphtheria cultures contained no diptheria germs at all; others that some of the germs simulating diphtheria in appearance were positively the real thing. So a tooth or a tonsil may contain a germ so similar to those found at the seat of secondary infection that they are indistinguishable, yet the germ may be harmless in one case and virulent in the other.

Certainly it is unlikely that we carry virulent germs about in teeth and tonsils for long years. For one thing they get acclimated to us and can change their murderous habits. For another we get used to them. This organism of ours is an hospitable sort of thing. The body tends to adjust in neighborly fashion to germs upon long acquaintance, or familiarity breeds contempt, just as it adjusts to morphine, to opium, to over-eating, to the corrosive harness oils now sold as bootleg whiskey and to tobacco, of course. Perhaps long acquaintance ripens into real friendship and mutual aid.

Nicotine is the active agent in tobacco. Mendenhall tells us that tobacco sometimes stimulates and sometimes depresses the bodily sensory mechanism, depending largely upon the state of fatigue prevalent at the moment. When stimulation occurs the effect is precisely that of a certain portion of high potential rest, for in this case, says our authority, tobacco has rested us artificially.

Certain work seems to prove quite clearly that tobacco slows down the gastric motility as

well as pepsin and rennin secretion. At least it produced such results on certain individuals, although the majority of mankind may be immune for all we know. This would slow down digestion, but it takes considerable smoking to accomplish such a result even with the susceptible, and one cigarette after a meal, even a cigar, would scarcely be sufficient. It has also been stated in scientific journals that tobacco *may* play an etiologic role in gastric neurosis, in gastritis, in ulcer and cancer of the stomach and, likewise, in mouth or throat carcinoma.

But, putting your mind rigidly to the task, can you readily think of anything from hot soup to worry that has not at some time by some person been accused of causing these conditions? Why is this? Holding a clay pipe in the mouth may cause mouth cancer; holding an ordinary pipe might; continuously holding a roughened stick there might also, with tobacco never involved. How do these anti-tobacco ideas arise?

Why are we told that so many things cause ulcer, cancer, kidney trouble, heart lesions or high blood pressure? Why are there so many theories of evolution or of creation, or of salvation for that matter? Why are there so many and such diverse theories of economic and political betterment? Why are there such varied schools of treatment often imposing diametrically opposed procedures to combat the very same maladies? Why do men differ so widely in their hypotheses about government, religion, tobacco, women? Simply because nobody as yet knows anything positively definite about these matters, and just so long as this condition of inspired ignorance persists, so long will infinitely varied opinions be inevitable.

In chemistry, in physics and in bacteriology, for instance, we do possess certain definite knowledge and we can rightfully cite certain facts. In sociology, in politics and in economics, we possess certain dogmas or beliefs and we can pardonably express certain theories or opinions—so long as we candidly admit their opinionative status. But when we get beyond a certain definite point in any science, even in physics and chemistry, we begin to hypothecate just like an economic determinist or an anti-vivisectionist or a religious fundamentalist, people who are habitually beyond this point of separating fact from belief anyway. We begin to express our opinions vociferously, to dress them up in moral overcoats, and to justify them just because we do lack certain scientific knowledge.

Thus we can go to the scientific work and find an investigator saying that very large quantities of tobacco smoke will paralyze the gastric contractile power. All right. But this very same investigator also sagely adds that small amounts of the smoke will actually stimulate this very gastric contractility and urge along digestion. Or we can go to the *Journal of the American Medical Association*, the highest current medical authority in the United States. We find a query by some doctor on cigarette smoking and we read the reply. Authority completely absolves cigarette papers from blame for poison. It adds that any cigarette smoker is safer from harm than a tobacco smoker of any other sort. For one thing he actually smokes less tobacco. If he nervously smokes many cigarettes he throws away longer and longer unused portions and thus keeps his consumption at about the same figure.

The Laryngoscope should be an authority on throat conditions as it is the publication of throat specialists. We find in here a statement to the effect that from a medical or laryngeal point of view there is no reason why anybody should give up tobacco or alcohol if it does them no very apparent harm. This is because the use of both in moderation by millions proves the harmlessness of the habit which is, in fact, often actually beneficial.

You can go further than that. If you want to be really mean you can find an authority to state that visual acuity is increased by smoking. When non-smokers smoked for they first time they saw better than they did before smoking. The sight of habitual smokers was unaffected by an additional smoke. They had already smoked themselves into the best possible eye-sight. This may be unreliable testimony. Far be it from me to judge it. The point is that it is quite as reliable as any of the testimony advanced against the tobacco habit.

In short we are here in a region where exact scientific investigation has not yet established reliable criteria of judgment. We cannot cite irrefutable facts. We can only express opinions and opinions are usually grounded in prejudice. Physicians tend normally to prohibit, but they rarely prohibit judiciously because, under our present chaotic medical system, they cannot afford to make a sound, thorough-going clinical examination of every patient and must regard medicine as an art—*i. e.*, fall back upon empiricism.

As for prejudice, it amounts to little. Cromwell and his Puritans smoked excessively. About 1840 women smoked outrageous stogies

and cumbersome pipes so shamelessly that men were alarmed and vigorous caricatures satirized them in the periodicals of the day. Early in the Victorian era smoking was all but a lost art. Today it is again in ascendency, yet human depravity has remained at about one level throughout.

In an editorial upon the subject during 1925 *The Journal of the American Medical Association* especially emphasized the fact that variations in human susceptibility and tolerance were factors as yet little understood. Extreme caution in generalization was wisely advised on such subjects as the harm inherent in tobacco smoking, and the reader was admonished that over-indulgence in turnips or parsnips, or even in water, would turn out a great deal worse than he might anticipate on immature consideration.

This factor of human individualization is rightly coming to the front in medical literature today. Advances in biological chemistry constantly attest the fact that each human individual is unique chemically. What Smith can do with impunity Jones can only do with a prospect of sudden death. This is not a superficial matter, but one deep seated in the cellular structure of the human body, a thing going back through ages of inheritance via the complex and ill-understood chromosome. More and more it is being realized that routine diets, prescriptions and prohibitions will not do in all cases—in fact are actually unsafe and dangerous in many.

For all we definitely know today with positive assurance we cannot deny the proposition that tobacco smoking is probably beneficial to many people. Not long ago everybody was

urged to go in for bran because we all sadly needed roughage. Bran would cure constipation and a thousand routine diets spattered the press. It was all very well, except that constipation persisted. Today it is realized that nervous and phychic factors have much more to do with constipation than diet and the parade has set in that direction now. In fact some authorities declare that these rough diets have actually had fatal consequences in certain instances where a smooth diet was required.

But medical science really does not know sufficient about the positive, absolutely undeniable effects of tobacco smoking upon human beings to parade in any direction as yet without painful danger of finding itself hopelessly bogged in error at some date in the near future.

DEBUNKING "DENICOTINIZED" TOBACCO

Some years ago it was quite evident that the cigarette was doomed. Groups of well desiccated females, assisted by large droves of impotent he-virgins, met together, assailed the "filthy weed," and determined to abolish it by vituperation if not by legislation. Tobacco manufacturers began to feel vague worries, some States passed anti-cigarette laws and righteousness seemed about to triumph. Then came the war!

War is a great release. We all live pretty prosaic lives. Social conventions are harsh and unless we live in Philadelphia or Chicago it is not considered courteous, much less expedient, to go out and rob, kill and commit arson. War delights in that it releases these crude desires which seem to be suppressed and lying potentially in wait in the most sedate of

us. Men were released to rob, murder and commit arson and they did it with a vim and vigor which belies the idea that we are becoming a decadent and anemic race.

At the same time war had its disadvantages. A chap needed stimulation. He needed whiskey; he needed women; he needed cigarettes. He got them all and the dear, good Christian souls applied themselves so whole-heartedly to the good work of providing needful stimulation that natural smiles began to sprout on technical virgins, liquor ceased to draw the sex line and cigarettes were actually dispensed by the hands of Christian ladies and gentlemen. The tobacco industry was saved.

After the war women decided to continue doing what they had done during the war. They decided to retain "This Freedom." Men decided they should not retain it. The Christians decided they should not retain it. It was against ethics, morals and law. The women retained their freedom and added to it. Among other things they smoked cigarettes so indefatigably that a consumption which had commenced to decline hopped to a point of unprecedented size.

Women are like that. Men are more civilized, have more modern bodies, are younger in an evolutionary sense and respect this nonsense called law. Women are much older physiologically—phylogenetically for that matter, if you really like long words. They adopt primitive means to accomplish their ends and primitive means are always effective. When they wanted to smoke they smoked and that was that.

At the same time, however, it is vaguely interesting to many people to know whether smoking is injurious. All sorts of ills have

been laid to its door. But there is this to be said in its favor. In very many people smoking is undoubtedly the percussion cap which sets in motion a train of conditioned reflexes and enables them to work efficiently.

Watson has worked on these conditioned reflexes. Let the young baby have a rat. It is not afraid and will play with it happily. But some day produce a blinding flash of light or a loud noise just as you give it the rat and you have imbedded a conditioned reflex which may last its life. It will always fear rats. Watson holds that education should address itself to the job of making our conditioned reflexes of such nature that they are helpful rather than a hindrance.

Thus a certain man cannot think unless he plays with the keys in his pocket. That is the original stimulus which sets his benign conditioned reflexes in motion. Another smokes in order to think deeply. A third smokes and finds that it is laxative. Perhaps these men cannot either think or avoid constipation unless they smoke, and the probable reason is that the act of smoking is an original stimulus which automatically sets in motion a long series of conditioned reflexes of a benign character.

Yet there are people who do not want to run any risks. They want to avoid nicotine. Perhaps it is as well that they should. They therefore buy cigarettes or cigars or tobacco which have been "denicotinized." To what extent do they succeed in avoiding the poison then? The Connecticut Agricultural Experiment Station Bulletin 295, a prosaic scientific-looking thing, pretty well explodes the bunk of these tobaccos and it calls a spade a spade.

More power to the research agencies of the U. S. A. which dare be so outspoken. A brief analysis of the results shown seems in order.

Tobaccos were analyzed for nicotine and the percentage given is in all cases on a dry basis. First tested were several common brands of cigarettes. They ran as follows in nicotine. Take your pick hereafter when you buy—

Cigarette.	Percent Nicotine.
Egyptian Deities	1.28
Pall Mall	1.38
Philip Morris	1.40
Lucky Strike	1.88
Camel	2.21
Old Gold	2.17
Capstan Navy Cut	2.30
Chesterfield	2.53
Piedmont	2.89

Since not even physicians have had any idea how much nicotine common brands of cigarettes carried this alone is important. Now how did the "denicotinized" cigarettes line up? They ran as follows:

"Denicotinized" Cigarette.	Percent Nicotine
Sano	2.32
Cestrada Virginia	2.10
Dormy Turkish	1.19
Sackett	1.02

Next I shall list the cigars and the smoking tobacco analyzed—

	Normal
Reyes de Espana	1.16
Manila	1.31
Knickerbocker	1.90

"Denicotinized"

Sano	1.07
O-Nic-O	.72
Sackett	.67

The smoking tobaccos tested ran—

Normal

Blue Boar Pipe	1.45
Weldon Slice	1.84
Hudson Bay Imperial	1.95
Gilbert's Mixture	2.09

"Denicotinized"

Dormy Smoking	2.26
Sackett	.98
O-Nic-O	.97

In short, the average for all brands tested stood 1.77 percent nicotine straight and 1.28 percent still in the "denicotinized" products. Seventy-two percent of the nicotine remains behind. The process is, like the process of removing caffeine from coffees, very largely bunk but it is bunk that makes the American people spend their money, as Barnum very well knew. A person can with considerable ease select an ordinary tobacco which is so near the nicotine content of the "denicotinized" varieties that he scarcely seems justified in paying the higher prices for the treated product.

Was ever a nation so neurotic over its health as ours? European observers are constantly amazed at the imbecile delight we show in all sorts of products especially treated to make them less toxic, more digestible, less harmful and more beneficial. Just tell an American that you have vacuum treated your coffee and have thereby removed some obscure organic compounds which normally tie his stomach in

knots and he will faithfully believe you and buy it. Tell him you have taken the nicotine out of his cigarette and though 72 percent of it is still there he will buy. Tell him Grapenuts make his teeth sound and he will buy. Tell him that he can improve his health by standing on his head on a cake of ice in a blast furnace while somebody shoots a stream of liquid platinum in his left ear and you will find some fool to do it in America. Why are we such damned fools? I am not going to tell you. I don't know. But we are.

IS COFFEE DRINKING HARMFUL?

It is recorded in the annals of history that a certain doctor once told a certain patient to drink no coffee. Were you, perchance, the patient? I know I was. But why did the doctor say that? Because if we stopped there would be more coffee left for him?

It is also recorded that there once lived a certain Arab whose name comes down to us as Chadely. Chadely is reputed to have been the initial coffee drinker of the world and he drank an extract of the berry to combat a continual drowsiness which prevented him from attending punctually his religious devotions! In this others of the Mohammedan faithful rapidly followed him, and the habit might well be cultivated by certain church-going Christians with sedative pastors.

Now I am one of those most unfortunate persons over whom alcohol has no appreciable authority. I confess this with shame and deep humiliation. Right in this Prohibition Era when various nondescript alcoholic beverages are held in higher esteem than ever before in our history (for does not the lowliest shellac

now become a sacred and inviolate symbol of a personal liberty we would not recognize in this collectivist country if we saw it?) I can drink one, two or even three glasses of high voltage and yet remain placid, neutral, passionless, taciturn and erect in posture. So far as I am concerned even the dynamic and remorseless cocktail of these days is just so much ill-tasting liquid. Isn't this tragic?

But I would not prohibit the sale, ingurgitation or even the flagrant abuse of these curiously synthesized beverages, or even of good alcohol drinks. Not for one single prohibitive instant. For I want my coffee and some day some bluenose wowser might seek to deprive me of the cup that really cheers me. For I can arise in the morning hopeless, misanthropic, pessimistic, with a strong suicidal impulse, a feeling of uselessness and a Calvinistic conviction of sin—yet one cup of good coffee completely reverses my emotions and stirs me to optimism, confidence, cheer and incipient exaltation. I can be induced to consider new fur coats and parlor rugs.

Or again, in the evening, I may have sunk into a mental stupor, becoming in fact so definitely subhuman that I can only listen to a radio or read a newspaper—but coffee at once changes the entire universe and suffuses me with self-satisfaction, energy, will power and complacency—jostles my brain cells rudely against each other and clicks out of them what little useful information there is in them. Indeed I strongly sympathize with any dull soul who momentarily sweeps aside the stagnant miasmas of toil, monotony and misery with a swig of ethyl alcohol—in varied disguise. In-

sensitive to alcohol I do exactly the same thing with caffeine.

It is a most curious matter upon which to meditate. The entire universe is not something static and permanently postulated by definition. It is not even what I made it a moment ago. It is what coffee makes me and makes me make it at this moment. Leaving my entire environment, debts and all, and my complete mental and somatic equipment *in statu quo* one dash of caffeine completely reorganizes the universe for me and as completely modifies my reaction thereto. The final test in any scientific experiment takes place when one variable factor accomplishes such results while all other factors remain completely unaltered. I know my coffee.

But of course this is a world wherein doctors sound solemn tocsins to pleasure. You go to them and they almost invariably admonish you to quit smoking tobacco and drinking coffee, to have your teeth pulled and your tonsils uprooted. Some years ago I myself suffered from chronic indigestion. I was on a meticulous diet which lacked meat and coffee and I was about ready to accuse coffee alone of all my indispositions. But I met a hardy old codger of eighty who drank eight cups of strong coffee daily and had but recently reduced his consumption from a normal dozen and his vigor, which he attributed to seventy years of strong coffee, greatly heartened me. I knew what the doctor would say. I didn't smoke. Teeth and coffee alone were left. So I went soberly to the expert in exodontia.

He at first demurred and insisted that I had no teeth meriting destruction. But I was desperate. I insisted. So he X-rayed around,

finally selected an inoffensive and courteous molar and drew it. The shock or something proved beneficial. At least I had no more indigestion and even learned how to drink two cups of strong coffee and go to sleep on the draft. This is the final step in expert coffee drinking. When you can perform that feat and outwit your imagination you have come into the inner circle of The Sacred Coffee Drinkers' Conclave.

But I remained curious. I wondered why doctors said drink no coffee. I determined to find out something about this. Botany didn't get me very far. It simply declared "Coffee is the product of a rubiaceous plant indigenous to Abyssinia of the *genus* coffea; there are about twenty-five known species, of which coffea Arabica is the most important commercially."

History was slightly more productive. It appeared coffee drinking was of respectable age and that the substance derived its name from K'hawah, or Kaffa, an Abyssinian Province, and that there it was employed as a stimulant for centuries before its introduction into Arabia. The Arab physician Khayes, who lived 850-922 A. D., wrote on coffee and knowledge of the plant arrived in Europe by the late sixteenth century. It is most interesting to remember that these Arabian Mohammedans used coffee as an anti-soporific during prolonged religious ceremonies. Yet the beverage at first underwent violent protest because strictly orthodox and conservative priests held it to be intoxicating and hence under the ban of the Koran.

At Constantinople certain dervishes also held that after roasting coffee had become a

kind of coal which the Prophet had denounced as inedible. Thereupon the coffee houses were closed. But a lenient mufti later proved to the satisfaction of the faithful that roasted coffee was not coal and they were reopened.

The earliest European coffee houses were established, in fact, in Constantinople and in Venice. The first one appeared in England in 1650; out of it grew the Oxford Coffee Club in 1655 and from that sprang the Royal Society itself. But alas, convivial gatherings at coffee houses became of ill repute; wives complained they could not expect their husbands back from errands because they would loiter in coffee houses and kings declared that their subjects met at coffee houses, became garrulous and bespoke political rebellion. The current Volstead, Charles II, therefore, sought to suppress coffee drinking, but evidently Anglo-Saxons valued their liberties more then than now for the King had little success. Frederick the Great, fearing coffee drinking for the more thrifty reason that it caused too much money to leave his domain, boldly attributed sterility to indulgence in the berry and sought to restrict the use of coffee by a license system.

The medical profession came forward to denounce coffee for all sorts of sins. The English Dr. Pecoke accused it of causing leprosy. Dr. Duncan of Montpellier in 1706 wrote in opposition to all hot beverages while James the I actually composed a royal "Broadside Against Coffee." The kingly book contained this gem—

Confusion huddles all into one scene,
Like Noah's arks, the clean and the unclean,
For now, alas! the drink has credit got,
And he's no gentleman who drinks it not.

Millingen in his "Curiosities of Medical Experiences," 1837, said that coffee in excess produced "feverish heat and a predisposition to apoplexy." But he did commend coffee and tea as beverages affording stimulus without producing intoxication. Francis Bacon declared that "coffee comforteth the heart and helpeth digestion" while Bach, to offset this, wrote his Cantata No. 211 of the "Secular Cantatas" to protest its use.

In 1792 Dr. Benjamin Moseley said doubt existed as to whether coffee was a tonic or a sedative, but believed that it had intrinsic food value. Every now and then individuals arise to denounce or to praise an article of diet or a diet system and to declare that all men should hear and follow because this idea was of benefit to them. Such statements can have no standing in science, even when made by a doctor and based upon his actual experiences with a few patients. The only possible way to find out whether coffee, say, is beneficial, or the reverse is to investigate the literature and try to poll the authorities each one of whom has examined large numbers of individual cases to see if any general statements can be hazarded. Even then we cannot make final conclusions but we can assay general trends.

Is coffee harmful then? What do physiologists, pharmacologists and medical men say? Coffee demonstrably enlivens the intellect, removes the sensation of fatigue and makes the subject feel more comfortable. These are gifts not to be sniffed out of court. But is coffee safe and harmless enough that we may dare indulge ourselves in this pleasant reaction in a world where the pleasant is so readily assumed to be *per se* the invidious—and so often

is actually so? The question is in dispute like most questions considered settled by many people. There is no more reason to conclude one way than the other in so far as average adults are concerned. All who say dogmatically "No coffee—it is very harmful" are as wrong as all who state the opposite of this.

In his "Personal and Community Health" C. E. Turner says coffee is not harmful to most adults in reasonable quantities. G. N. Stewart's "Physiology" remarks that tea and coffee are safe stimulants because they have no bad after effects. Stewart also cautions against their abuse, but it may as well be stated at once that the question of abuse introduces an altogether new factor. Water and salt are absolutely necessary to life but the abuse of either is injurious. We can produce true water intoxications and salt eaten to excess can do us much harm. All articles of diet from parsnips and lamb chops to caffeine and alcohol can harm if abused and we should assume when speaking of them a sane, rational use and regard abuse as a harmful condition of a different order altogether.

As C. E. A. Winslow well says in his "Healthy Living"—"The fact that tea and coffee sometimes become tyrants does not mean that such drinks are necessarily bad."

In one thing medical authorities do agree, however, coffee and tea are not beverages for children. Moralists to the contrary notwithstanding, this is again beside the point when we are considering the reasonable use of coffee by adults. Adults and children are essentially different animals using their food intake differently—the one for upkeep and repair the other for new construction as well as upkeep

and repair. They differ basically in metabolism. They have different metabolic rates and different expenditures of energy. The child is turning food into flesh and bone and blood at a much greater rate than a fully-grown adult organism is ever required to do. Diets which would amply sustain an adult may easily be detrimental to or deficient for young and growing children. We shall, then, restrict ourselves herein to the rational use of coffee by average adults. What can coffee, or its active principle caffeine, do to harm adults?

Caffeine definitely increases the force of the heart beat. Yet Wood, "Notice of Judgment Under the Food and Drugs Act No. 1455 1912," says such an effect may be desirable since a slower rate and increased force induce cardiac efficiency. Heavy coffee drinking may produce a frequent, hard pulse and palpitations, but this again goes over into the territory of abuse.

Coffee tends both to dilate the vascular system and to constrict it, the net result being a mass movement of the blood without increased blood pressure. Coffee has repeatedly been suspected of damage to the heart and blood vessels but such suspicions are common in therapy and evidence is entirely lacking to prove this point scientifically. Suspicion is here probably no more legitimate than in many lay superstitions. While patients with definite heart trouble should avoid all stimulants the normal use of coffee by an adult cannot be said to have an insidious effect upon the heart and blood vessels.

While coffee is a diuretic it cannot be convicted of renal injury as yet. Indeed it is quite probable that the kidneys become accus-

tomed to caffeine while A. R. Cushny (J. Pharmacol. & Experimental Therapy 4 363) declares that caffeine does not injure the kidneys even when given in large dosage over long periods.

But how about digestion? Years ago Fraser (J. of Anatomy & Physiology 184 13 1883) said that coffee and tea hindered the digestion of protein foodstuffs with the exception of ham and eggs! This very fortunate immunity renders the typical American dish a safe breakfast in any case. In general, however, observations *in vivo* indicate that the amounts of the beverage usually taken have no evil effects upon digestion. Indeed some investigators have found a pronounced increase in gastric secretion following tea and coffee.

"Hutchinson in his "Food and Dietetics" says that the digestive disturbance caused by such infused beverages is negligible in health, Others have held that the aromatic constituents of coffee, or the "empyreumatic oil," upset digestion. There may be some reason for this; at least certain individuals tolerate much better coffee from which these substances have been removed.

Caffeine is of course a stimulant to the central nervous system, particularly that part of it intimately associated with the gastric function. How far is its use as such a cerebral stimulant advisable? Like all stimulants this will result in greater fatigue on excessive usage. But as "The Medical Review of Reviews" once said, "When tea and coffee are made moderate in strength and partaken of in sober quantities they are gentle stimulants and their effect upon the nervous system is salutary." A too constant reliance on coffee as a goad may of course result in nervous irritability.

Coffee speeds up the metabolism, increases the body heat and heat elimination, and perhaps urges us on to greater activity. But, as the English pharmacologist Dixon remarks in his "Manual of Pharmacology," "Caffeine decidedly facilitates the performance of all forms of physical work." Yet certain athletes are reported to have had their performances injured by coffee drinking, while Osborn holds that coffee interferes with the best muscular efforts. Take Hobson's choice here, you have an authority either way and we do love some one to give our opinions an affidavit. It may be observed that coffee also increases the rate and depth of our respiration.

The following gracefully and euphoniously named aromatics have been found in roasted coffee — pyrol, quinol, methylamin, acetone, furfuryl alcohol, a derivative of saligenin, phenols, valeric acid, pyridin and trimethylamin. You are no doubt much surprised and edified to know that. Some of these compounds are toxic, but they occur in coffee in amounts far too small to be dangerous to health. Some have accused these formidably named derivatives of bad effects but the work existing shows caffeine to be the only coffee constituent of importance in its physiological effects. It is agreed that caffeine is very rapidly changed by the body into less active substances and disposed of, so there can be no cumulative effect even of that. In old age, as in youth, coffee, like other stimulants, should be used in moderation if at all.

As a whole then what can we conclude about the use of coffee by adults? Science has not found it harmful when taken in non-excessive amounts. Heart patients, neurotics, the young

and the aged should avoid it. It has not been proven to cause pathological changes in the heart, blood vessels or kidneys. It is a valuable cerebral stimulant and antidote for mental fatigue, lacking as it does the bad effects of most stimulants. It also stimulates respiration and speeds up the metabolism, while its effects on digestion cannot be said to be definitely deleterious. Tea, because of its tannin contest, is probably worse than coffee gastrically. Finally caffeine is rapidly oxidized and has no cumulative poisonous effect.

Most important of all we must remember that individuals differ. They are constructed of different proteins and have cellular and glandular processes differing from individual to individual. What one can do with impunity another will find bringing him nearer to the undertaker daily. In this as in all other matters dietetic common sense and sound judgment in appraising our own state of health and the reactions of our organism to various stimuli will always surpass slavish subservience to systems or morbid efforts to avoid all harm and achieve an impossible all good.

Then if we are to drink coffee let us consider momentarily how best to make it. One basic fact stands out—freshly ground coffee is best. Ground coffee loses its flavor on standing. It also loses its content of carbon dioxide. These two factors are definitely related but exactly how and why we do not know.

In considering coffee-making precise scientific methods are everything. Our mothers, more energetic than the decadent women of today, made their own bread. They often appraised various flours by such rude methods and declared this brand better than that. How much could they have known about it? Did they keep every factor constant except the

flour when making their tests? You know they did not.

Go into the laboratory in the U. S. Bureau of Chemistry, where flour bought by the government is tested, and what do you see? You see an apparatus enabling the investigator to make bread from that flour holding every factor constant except the flour. All other materials used are precisely the same and all materials are carefully weighed. The dough is kneaded mechanically and timed exactly. Fermentation takes place in a cabinet at a constant temperature and for a definite time for all loaves. The same holds for the time and temperature of baking. The loaves are cooled just alike on wire meshes for the same time. They are weighed and their volumes measured. Then the investigator positively knows which flour makes the best loaf of bread and the government buys that flour for its hospitals and penitentiaries.

It is exactly the same with coffee. To test coffees they must be infused in very precise ways. How is it done? In the first place pulverized coffee must pass a 30 mesh sieve and be like fine cornmeal, medium ground coffee must pass a 10 mesh sieve and be like steel cut; coarsely ground coffee must pass an 8 mesh sieve and appear like the rude, home ground bean of our childhood.

Then boiling, boiling with egg, percolation and filtration must be tried on each by precise methods. A 40c Mocha-Java coffee may be used with 12 grams of coffee and 240 cc. of water, except in the case of percolation which requires 480 cubic centimeters of water for 12 grams of coffee. In boiling with egg 10 grams of egg white were added. The infusion must be governed precisely.

Boiling takes place in a seamless white

namel pot, cold water being poured over the coffee, the whole brought to a boil and boiling continued for three minutes; the infusion then stood five minutes and was ready. It was strained through cheese cloth. Percolation was carried out in the usual manner with an ordinary percolator, the water being cold at the start and boiling being continued for five minutes. In filtration a wire strainer was put across the top of the pot covered with a piece of tennis flannel upon which the coffee lay. Boiling water was poured through once.

The brews were tested hot, for strength, color, and flavor by various people who did not know the methods of preparation. Six degrees of strength were observed with specific gravities of the brew by test as shown in the table—

Very weak	1.0045 Specific Gravity
Weak	1.0055 Specific Gravity
Moderately strong	1.0060 Specific Gravity
Standard	1.0065 Specific Gravity
A little too strong	1.0070 Specific Gravity
Much too strong	1.0080 Specific Gravity

The specific gravity was taken on the cold brew and a standard, 1.0065 was selected for further tests. The following table indicating condition of coffee, method of brew, weight of coffee used and cost per cup is of considerable interest—

Condition	Method of infusion	S. G. 1.0065 Weight Coffee Grams	Cost per cup cents
Pulverized	Boiling	12.05	.63
Pulverized	Percolated	12.78	.71
Pulverized	Boiled with egg	12.85	1.05
Pulverized	Filtered	12.31	.72
Medium	Boiling	15.89	.83
Medium	Percolated	22.94	1.29
Medium	Boiled with egg	16.71	1.29
Medium	Filtered	30.00	1.73
Coarse	Boiling	19.79	1.03
Coarse	Percolated	27.52	1.54
Coarse	Boiled with egg	21.27	1.56

Hence it is apparent that pulverizing is the most efficient method of grinding. The best brew is made by filtration. Boiling with egg is second best while plain boiling and percolation are the poorest of all. In general, strength and color of the brew are quite independent of the blend and price but depend upon the grind. The flavor, however, varies markedly with the coffee brand and price. Java, Sumatra and Bogota give weaker infusions under the same conditions than do Mocha and Santos. The order of preference for flavor stood—Java, Sumatra, Santos, Bogota and Mocha. It was also observed that coffee which had stood long after grinding gave an infusion of a lower specific gravity and hence of impaired strength.

The effect of adding sugar and cream to coffee is not well understood. Some assert that the fat of cream and the fats of the coffee bean form indigestible compounds, but there is scarcely sufficient experimental evidence to justify this. The tannin compounds in coffee are apparently not precipitated, as has frequently been stated, by the addition of sugar and cream. Testing a centrifuged cream from a beverage coffee gave no appreciable evidence of tannin while the remaining coffee infusion gave the normal positive tests for tannin. It is certainly true, however, according to one authority that black coffee without any additional substances, with the possible exception of a portion of sugar, is the most beneficial form of the beverage.